Model Creation

Step 1 : Import Libraries

In [38]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_absolute_error , mean_squared_error , r2_score
```

Step 2 : Load the dataset and display the first 5 rows

In [39]:
```
data = pd.read_csv("C:\AIML\project\shivamogga_house_cleaned.csv")

data .head()
```

Out[39]:

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	Dist_to_Railway_km	Parking_Available	Gated_Security
0	1.367597	4	4	-0.281449	-0.406812	-1.182767	0	0
1	1.255005	4	4	2.584619	1.337755	-1.093933	0	0
2	1.259438	4	4	1.124977	0.869351	0.406725	0	0
3	0.922548	4	4	1.140182	1.916091	0.340099	0	0
4	-1.168829	2	3	-0.760395	0.630369	1.640881	1	0

In [40]:
```
data.drop("Price_per_SqFt",axis=1,inplace=True)
```

In [41]:
```
data.head()
```

Out[41]:

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	Dist_to_Railway_km	Parking_Available	Gated_Security
0	1.367597	4	4	-0.281449	-0.406812	-1.182767	0	0
1	1.255005	4	4	2.584619	1.337755	-1.093933	0	0
2	1.259438	4	4	1.124977	0.869351	0.406725	0	0
3	0.922548	4	4	1.140182	1.916091	0.340099	0	0
4	-1.168829	2	3	-0.760395	0.630369	1.640881	1	0

In [42]:
```
data.info() #chack the info
```

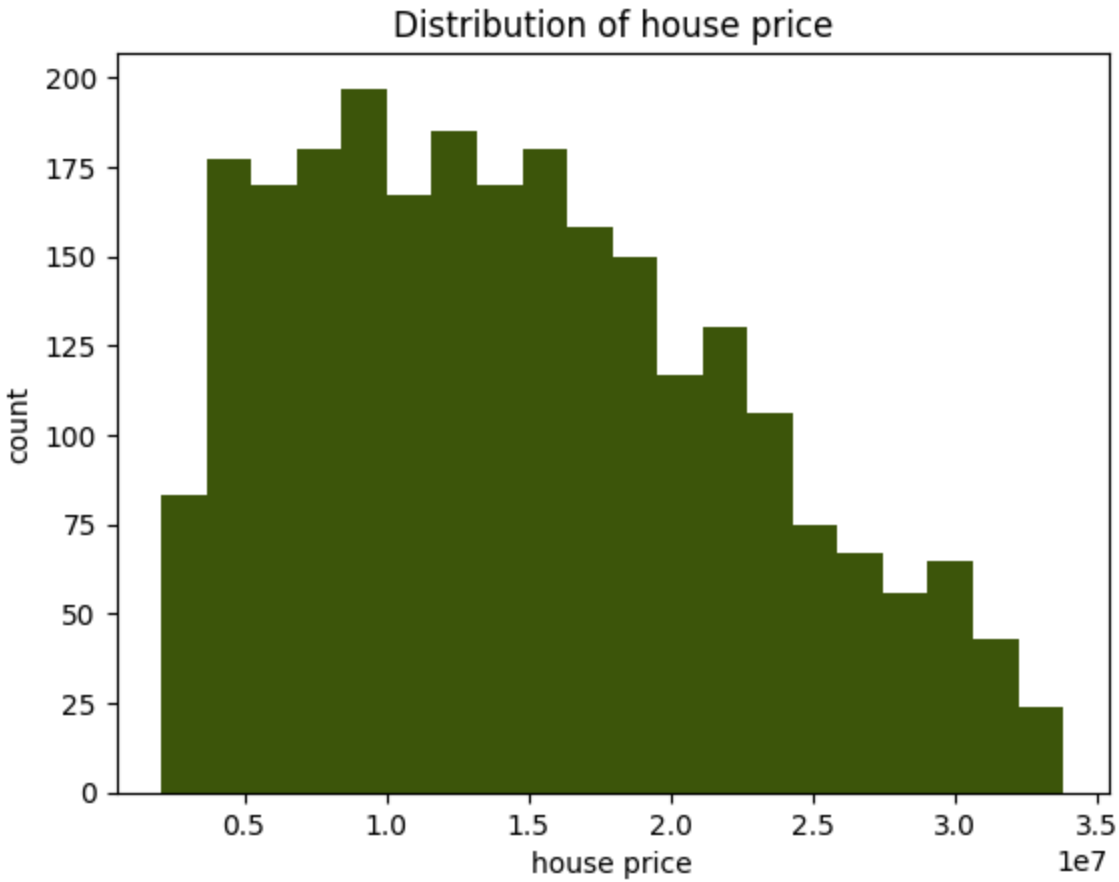
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2500 entries, 0 to 2499
Data columns (total 19 columns):
 #   Column                 Non-Null Count  Dtype  
---  ------                 --------------  -----  
 0   Total_SqFt             2500 non-null   float64
 1   BHK                    2500 non-null   int64  
 2   Bathrooms              2500 non-null   int64  
 3   Dist_to_School_km      2500 non-null   float64
 4   Dist_to_Hospital_km    2500 non-null   float64
 5   Dist_to_Railway_km     2500 non-null   float64
 6   Parking_Available      2500 non-null   int64  
 7   Gated_Security         2500 non-null   int64  
 8   Price_INR              2500 non-null   float64
 9   Total_Distance_Score   2500 non-null   float64
 10  Bath_per_BHK           2500 non-null   float64
 11  Amenity_Score          2500 non-null   int64  
 12  Locality_Basavanagudi  2500 non-null   int64  
 13  Locality_Bommanakatte  2500 non-null   int64  
 14  Locality_Gadikoppa     2500 non-null   int64  
 15  Locality_Gopala        2500 non-null   int64  
 16  Locality_KHB Colony    2500 non-null   int64  
 17  Locality_Sulebailu     2500 non-null   int64  
 18  Locality_Vinoba Nagar  2500 non-null   int64  
dtypes: float64(7), int64(12)
memory usage: 371.2 KB
```

In [43]:
```
data.describe() #display the statistical info
```

Out[43]:

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	Dist_to_Railway_km	Parking_Available
count	2.500000e+03	2500.000000	2500.000000	2.500000e+03	2.500000e+03	2.500000e+03	2500.000000
mean	-1.243450e-16	3.108800	3.303600	-5.755396e-17	-2.025047e-17	-6.394885e-17	0.808000
std	1.000200e+00	0.955682	1.045688	1.000200e+00	1.000200e+00	1.000200e+00	0.393952
min	-1.740655e+00	1.000000	1.000000	-1.444602e+00	-1.362739e+00	-1.728461e+00	0.000000
25%	-8.678442e-01	2.000000	3.000000	-6.995763e-01	-7.509458e-01	-8.599514e-01	1.000000
50%	-3.012504e-03	3.000000	4.000000	-3.042564e-01	-3.159989e-01	-2.475420e-02	1.000000
75%	8.844263e-01	4.000000	4.000000	4.578747e-01	5.455304e-01	8.445488e-01	1.000000
max	1.714239e+00	4.000000	5.000000	2.957132e+00	2.843340e+00	1.758269e+00	1.000000

In [44]:
```
plt.hist(data['Price_INR'],bins=20 , color="#3d570e")
plt.xlabel("house price")
plt.ylabel("count")
plt.title("Distribution of house price")
plt.show()
```



Step 3 : Split the Feature and Target

In [45]:
```
X = data.drop("Price_INR",axis=1)
Y = data["Price_INR"]
```

Step 4 : Split the data into train and test

In [46]:
```
X_train , X_test , Y_train , Y_test = train_test_split(X , Y ,
     test_size = 0.2 , random_state=42)
```

Step 5 : Train the model

In [47]:
```
model = RandomForestRegressor(n_estimators=100, random_state=42)

# fit the model
model.fit(X_train , Y_train)
```

Out[47]:
```
▾ RandomForestRegressor
▶ Parameters
```

Step 6 : predict on test data

In [48]:
```
y_pred = model.predict(X_test)
```

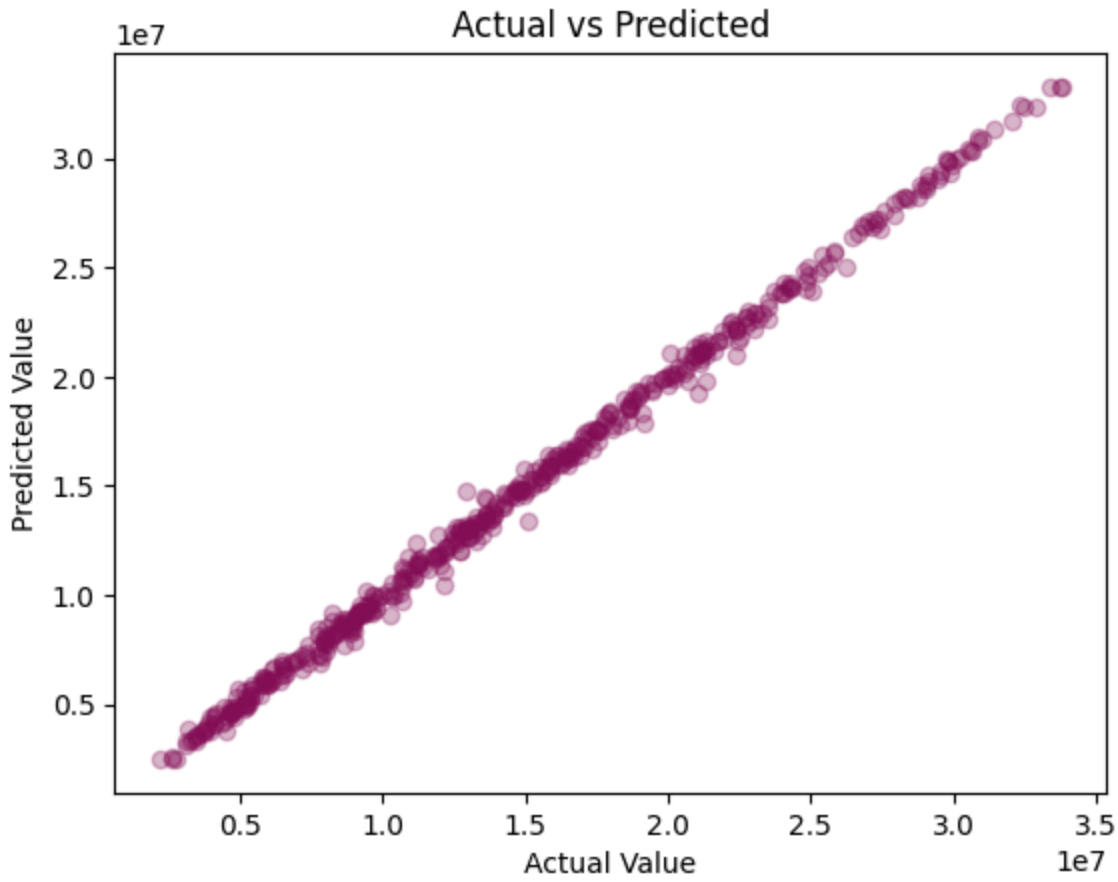
Step 7 : Evaluate the model

In [49]:
```
mae = mean_absolute_error(Y_test , y_pred)
mse = mean_squared_error(Y_test , y_pred)
rmse = np.sqrt(mean_squared_error(Y_test , y_pred))
r2 = r2_score(Y_test , y_pred)
print("mean absolute error :",mae)
print("mean_squared_error :",mse)
print("Root mean squared error :",rmse)
print("r2 score :",r2)
```

```
mean absolute error : 270286.6
mean_squared_error : 150568503262.0
Root mean squared error : 388031.57508378103
r2 score : 0.9973779707757855
```

Step 8 : Visualize the Actual vs Predicted value

In [50]:
```
plt.scatter(Y_test , y_pred,alpha=0.3 , color="#860f58")
plt.xlabel("Actual Value")
plt.ylabel("Predicted Value")
plt.title("Actual vs Predicted")
plt.show()
```


Actual vs Predicted
1e7
3.0
2.5
2.0
1.5
1.0
0.5
Predicted Value
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Actual Value
1e7